DEVELOPMENT OF NEW RULES CONCERNING MERCURY EMISSIONS FROM COAL-FIRED POWER PLANTS

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Overview

On March 18, 2005, the U.S. EPA signed the Clean Air Mercury Rule (CAMR) to permanently cap and reduce mercury emissions from coal-fired power plants serving a generator larger than 25 megawatts that produces electricity for sale. CAMR builds on the Clean Air Interstate Rule (CAIR). When fully implemented, CAMR will reduce utility emissions of mercury from 48 tons a year to 15 tons a year, nationwide. CAMR creates a market-based cap and trade program to reduce mercury emissions in two phases: Phase 1 in 2010 and Phase II in 2018. The Phase I cap is based on "co-benefit" reductions; these are mercury reductions that will be achieved by reducing sulfur dioxide (SO_2) and nitrogen oxides (NO_x) emissions under CAIR. New coal-fired power plants will also have to meet a new source performance standard (NSPS) in addition to being subject to caps (40 CFR Part 60, Subpart Da). The Phase 1 cap for Indiana is 4,194 pounds (14% reduction from 1999 levels) and the Phase II cap is 1,656 pounds (66% reduction from 1999 levels).

The draft rule generally follows the CAMR model trading rules (40 CFR 60, Subpart HHHH) and contains the same key elements. Much of the state rule incorporates federal language with little or no change. In several areas, the state has more flexibility to adapt the rule to its particular needs. IDEM has worked extensively with the public on those issues.

Citations Affected

Adds: 326 IAC 24-4.

Affected Persons

The public and 71 units located at 23 power plants (nine companies). Eight of these units have either shut down or repowered and will initially receive allowances under the cap and trade program.

Reason or Reasons for the Rule

The federal CAMR requires states to develop a Clean Air Act Section 111 state plan (rule) to implement and enforce the CAMR standards of performance. If a state does not develop a state rule U.S. EPA will implement a federal plan in that state to reduce mercury emissions from coal-fired power plants.

The Indiana Air Pollution Control board also received a petition from the Hoosier Environmental Council (HEC) in June 2004 to regulate mercury emissions from power plants. The HEC petition requested mercury limits for coal-fired power plants of 0.6 lbs Hg/TBtu or an emissions rate equal to 90% reduction of mercury from the measured inlet conditions. IDEM is not proposing to adopt the limits proposed by the HEC petition, but instead follow the limits and caps provided in the federal rule.

Economic Impact of the Rule

IDEM has conducted a fiscal analysis for submission to the Office of Management and Budget (OMB). OMB issued its fiscal impact analysis on February 27, 2007. It is included in this board packet. The fiscal analysis includes two scenarios: Scenario 1 for cost estimates by IDEM and Scenario 2 for cost estimates by the Indiana Utility Group (IUG), a coalition of Indiana Energy Association members and individual power plants. Costs are incremental to the existing federal and state requirements, such as the federal Acid Rain program, NO_x SIP Call rule, and CAIR.

The estimated cost includes the cost of retrofit controls and emissions trading (i.e., the net cost of buying/selling allowances). The net total annual cost estimate (in 2005 dollars) for each phase is:

Scenario 1 (IDEM)

Phase 1: -$26 million
Phase II: $64 million

Scenario 2 (IUG)

Phase I: -1 million
Phase II: $68 million

The State Utility Forecasting Group (SUFG) at Purdue University projects that the impact on electricity rates (% increase or decrease) for each scenario is:

Scenario 1 (IDEM)

- Phase 1: -0.24%
- Phase II: 0.79%

Scenario 2 (IUG)

- Phase I: 0.14%
- Phase II: 1.06%

Benefits of the Rule

Reducing the amount of mercury emitted into the air is an important step in improving the health of Indiana's citizens. Once mercury is released to the air from coal combustion and other sources, it can fall to the earth through rain and snow (wet deposition) or dust particles (dry deposition). After it settles in lake or river sediments, mercury can be converted by bacteria into methylmercury, a more toxic form of mercury. Mercury in fish, both freshwater and marine, is then consumed by people and wildlife. Women of childbearing age are considered the population of greatest concern for mercury exposure, because the developing fetus is the most sensitive. Children are at risk as well since their nervous systems are still developing.

IDEM has projected mercury emissions under the cap and trade program in Indiana for 2018 at 2,001 pounds (IUG: 1,492 pounds). This represents a 59% (IDEM) (IUG: 69%) reduction compared to 1999 estimated emissions.

U.S. EPA evaluated the impact of CAMR on mercury deposition in 2,150 watersheds across the United States and found the deepest reductions in deposition would be in places where utilities have the biggest impact. By 2020, utility emissions will account for not more than 20% of deposition in any one watershed. This is a reduction from the maximum 55% contribution in the 2001 base case. On average, U.S. utilities will contribute 2.5% to deposition rates in 2020 after CAMR, CAIR, and other Clean Air Act programs are in place.

Description of the Rulemaking Project

The draft rule follows the federal model rule with little or no change except for the allocation methodology. Units must monitor mercury emissions using continuous emission monitoring methods. Mercury allowances will be assigned based on historical heat inputs. Compliance will be demonstrated with mercury allowances being equal to mercury emissions for the entire year (measured in ounces). The draft rule includes a new unit and a clean coal technology set-aside.

Two changes from the federal rule that are not part of the allocation section of the rule concern syngas and provisions for record retention at a central location for unattended sources. Syngas falls into the definition of "coal-derived fuel" and once produced, may be introduced into intra-state and interstate gas pipelines, mixing with other combustion gases, for general distribution. If it were so introduced, many Indiana combustion units now firing natural gas could become mercury budget units, subject to the Indiana mercury rule. IDEM is proposing to address this issue by excluding such syngas from the definition of "coal-derived fuel" in the Indiana mercury rule. IDEM is also proposing, as was adopted in CAIR, provisions for unattended sources that would allow for the retention of records at a central location within Indiana. Inclusion of these provisions in the Indiana mercury rule will help address the practical concerns of affected parties faced with this situation and provide certainty compared to the petition

process contained in the federal CAMR.

There are several changes from the allocation methodology included in the federal model rule, including an allowance set-aside for clean coal technology. The changes are as follows:

Timing of Allocations for Electric Generating Units (EGUs)

IDEM is proposing a methodology that includes a six (6) year allocation, six (6) years in advance, for the mercury trading programs, similar to the allocation scheme adopted in CAIR. For the initial allocation this will include allowances from 2010 through 2014 and will only cover five (5) years to match up with the initial allocation period in CAIR. This is slightly different than the model rule, which provides for states to make an initial allocation for Phase I (2010-2014) and then make annual submissions of allocations six (6) years in advance. The longer allocation block provides greater certainty on the number of available allowances for planning purposes.

Baseline for Existing Units

The allocation methodology makes a proportional allocation of allowances to individual EGUs based on heat input to the boiler, which is a measure of fuel usage and heat content of the fuel. The draft rule updates baseline heat input information using the most current eight (8) years of data every six (6) years. The longer look back period for the initial allocation (1998-2005) is more appropriate than the timeframe in the model rule (2000-2004) because many Indiana sources were installing equipment to comply with the NO_x SIP Call, which would not be representative of "normal" operations. U.S. EPA's model rule did not include a baseline that would be updated over time; retired units would continue to receive allowances forever and existing units would have allocations based on data that is eventually decades old. The draft rule provides that the most recent operational data would be used for calculations and that a retired unit would eventually stop receiving allowances.

Heat Input and Output Adjustment Factors

The draft rule does not include adjustment factors for heat input (existing units) and uses electrical output (new units) for determining baseline.

- IDEM is proposing a fuel neutral approach for calculating heat input values for different coal ranks. All coal types will be treated the same.
- The draft rule retains the output-based provision for new units, but modifies the electrical output to heat input conversion factor to provide a greater benefit for more efficient units. New units use electrical output data to convert output into heat input for the determination of the baseline.

New Unit Set-aside

The draft rule includes a new unit set-aside of four percent (4%) of the total budget through 2014 and two percent (2%) for 2015 and later years. An additional one percent (1%) of the budget is apportioned for new units that qualify as clean coal technology units.

New Unit Clean Coal Technology Incentive

The draft rule includes an alternative way to calculate allowances and a set-aside for clean coal units to receive additional allowances to provide an incentive for clean coal technologies in Indiana. IDEM is proposing to define clean coal technology units as the same types of coal-fired units that U.S. EPA has defined as 'repowered' units in CAMR, for example, integrated gasification combined cycle (IGCC) and pressurized fluidized bed combustion technology. The clean coal incentive is limited to units commencing operation before January 1, 2018 to provide incentives for pioneering projects. The modified allowance calculation for clean coal units provides the option of using a reasonable surrogate of full performance when electricity output may be low during the initial years of operation. The second component of this incentive is a clean coal technology set-aside. The set-aside is one percent of the total mercury allowances taken from the new unit set-aside for control periods through 2021.

Summary of Mercury Trading Program Budget (ounces)

	2010-2014	2015-2017	2018-2021	>2021
EGU existing	63,749	65,091	25,701	25,701
EGU new	2,684	1,342	530	795
Clean coal	671	671	265	0
Total	67,104	67,104	26,496	26,496

Federal Plan

U.S. EPA proposed a federal plan to implement CAMR in states without an approved state plan on December 22, 2006. In this federal plan U.S. EPA proposes to record unit-by-unit allocation in source accounts by December 1, 2007, for allocations in 2010. The state rule will not be effective and approved by this date. If U.S. EPA retains the option for state allocations under the federal plan in the final federal plan (i.e., partial federal plan approval), IDEM will submit an emergency rule to U.S. EPA for approval of an allocation methodology for 2010 allocations. This would preserve the ability for state allocations in 2010.

Scheduled Hearings

First Public Hearing: May 2, 2007, Room A, Indiana Government Center South, 402 West Washington Street, Indianapolis, Indiana.
Second Public Hearing: September 5, 2007 or October 3, 2007.

Consideration of Factors Outlined in Indiana Code 13-14-8-4

Indiana Code 13-14-8-4 requires that in adopting rules and establishing standards, the board shall take into account the following:

1) All existing physical conditions and the character of the area affected.

2) Past, present, and probable future uses of the area, including the character of the uses of surrounding areas.

3) Zoning classifications.

4) The nature of the existing air quality or existing water quality, as appropriate.

5) Technical feasibility, including the quality conditions that could reasonably be achieved through coordinated control of all factors affecting the quality.

6) Economic reasonableness of measuring or reducing any particular type of pollution.

(7) The right of all persons to an environment sufficiently uncontaminated as not to be injurious to:

(A) human, plant, animal, or aquatic life; or

(B) the reasonable enjoyment of life and property.

Consistency with Federal Requirements

The new rules and amendments are consistent with federal rules.

Rulemaking Process

The first step in the rulemaking process is a first notice published in the *Indiana Register*. This includes a discussion of issues and opens a first comment period. The second notice is then published which contains the comments and the department's responses from the first comment period, a notice of first meeting/hearing, and the draft rule. The Air Pollution Control Board holds the first meeting/hearing and public comments are heard. The proposed rule is published in the *Indiana Register* after preliminary adoption along with a notice of second meeting/ hearing. If the proposed rule is substantively different from the draft rule, a third comment period is required. The second public meeting/hearing is held and public comments are heard. Once final adoption occurs, the rule is reviewed for form and legality by the Attorney General, signed by the Governor, and becomes effective 30 days after filing with the Legislative Services Agency.

IDEM Contact

Additional information regarding this rulemaking action can be obtained from Susan Bem, Rule Development Section, Office of Air Quality, (317) 233-5697 or (800) 451-6027 (in Indiana).